FARM INDEX

U.S. Department of Agriculture
July 1977

Mountain States' Agricultural Roundup

Outlook

It now looks like grocery store prices will be up as much as 6 percent for the full year. That's a tad more than ERS economists were predicting months back . . . before the coffee situation turned from bad to worse . . . before the weather turned malicious for a while. More unfavorable weather could send the economists back to the drawing board.

That 6 percent doesn't account for the surge in away-from-home eating prices. They're apt to climb even faster than the grocery tab, reflecting spiraling costs of the middleman.

On the brighter side, most of the food price rise is behind us. Look for some slowing in retail price advances this summer and fall, assuming weather is kind to crops.

Red meats in hot demand. The barbecue season finds orders for steaks and hamburgers outpacing supplies. Choice beef prices this summer are expected to go up 3 or 4 percent from recent levels . . . hamburgers, even more than that.

There's little consolation for pork lovers, either. Summer pork prices are slated to shoot up 8 to 10 percent over spring averages, again, because of shrinking supplies. Hot dogs will cost more, too.

Poultry follows suit. Higher pork prices will rub off on poultry. Chicken prices will creep up this summer . . . maybe a tenth more than a year ago at this time. They'll descend later on, in keeping with the usual autumn trend.

Dairy products plentiful. Dairy cases in coming months will feature more milk, butter, and cheese—especially the last two. But shoppers can expect to pay even more for milk than lately, as the April rise in support prices to dairy farmers ripples to the marketplace.

Vegetables on the rebound. The California drought is keeping retail prices up there . . . higher than last summer. Even so, the vegetable bin is well stocked. On the plentiful list for fresh items: snap beans, broccoli, cabage, cucumbers, and tomatoes.

Hooked on fish. Jumping fish consumption plus heavy catches in the world's fish bowl will keep retail prices on the firm side. They're already at all-time highs, with no relief in sight unless stocks can be replenished. Count on further price hikes for the rest of the year.

Bargains on fruits. Prices for major items will continue rising this summer. Blame it on the freeze in Florida and smaller supplies of apples. Come fall, however, apple and citrus prices will weaken. Watch for other bargains as fruits come into season . . . peaches, cherries, nectarines, and plums, in particular. Story is less rosey for canned fruits. Expect more price markups . . . same for frozen orange juice.

Bread on the table. Bread won't be taking a bigger slice of grocery budgets this summer . . . should remain near 35 cents for a pound loaf. U.S. is harvesting a big wheat crop this year. Reserves haven't been so large in 10 years, and bakery product shelves will be well stocked.

Coffee break? Coffee prices might take a breather this summer, barring weather problems in Brazil. But no one is sure as to just when prices will peak . . . or at what level. Meantime, consumers are resisting. Coffee use this year in the U.S. could be the least since 1925.

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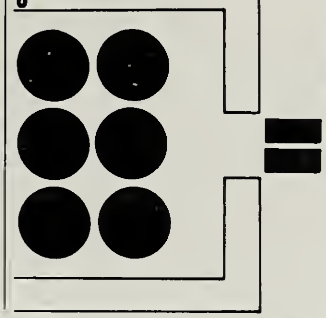

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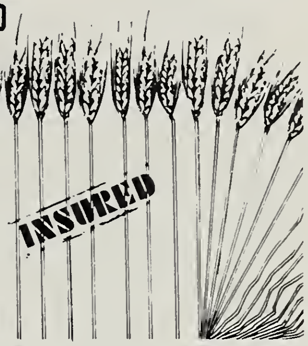


Features

Departments

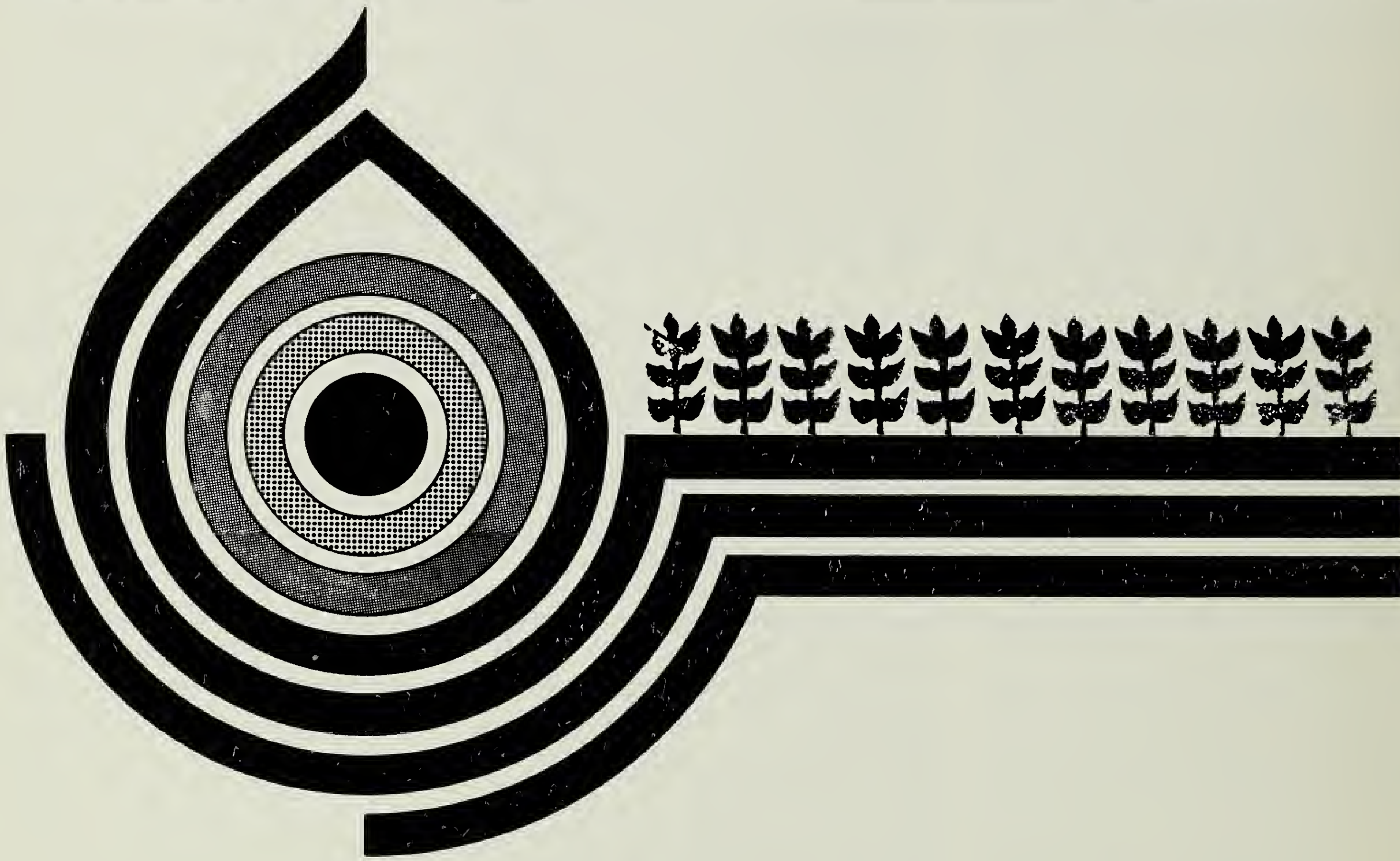
Daniel R. Williamson, Editor
Dorothy Mayes, Associate Editor; Martha Newton, Jerry Casbolt, Staff Editors;
Martin Schubkegel, Contributing Editor; James Schleyer, Art Director.

The Farm Index is published monthly by the Economic Research Service, U.S. Department of Agriculture. July 1977. Vol. XVI. No. 7.

Readers are invited to write for the research materials on which we base our articles. Address queries to The Farm Index, Rm. 1664, Economic Research Service, U.S. Department of Agriculture, Wash., D.C. 20250. Please cite article titles when ordering.

Contents of this magazine may be reprinted without permission. They are based on research of the Economic Research Service and on studies done in cooperation with State agricultural experiment stations. The Secretary of Agriculture has determined that the publicaion of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this publication approved by Director of the Office of Management and Budget through May 24, 1982. Subscription price $7.70 yearly ($9.65 foreign). Order from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Use of commercial and trade names does not imply approval or constitute endorsement by USDA or the Economic Research Service.

Fueling U.S. Agriculture Part II



A challenge for the future: To ensure that the American farmer has enough energy to produce food and fiber in adequate amounts at reasonable costs, for both our own population and vital world trade.

That's a tall order, considering the energy the farmer needs. But energy experts in USDA say it can be done, through a combination of Government programs and energy management by individual farmers—making the most efficient use of their energy sources.

Maintaining a sufficient supply of energy in the proper form, at the right time, and in the places it's needed, has become even more crucial than keeping energy costs down.

The energy budget. American farmers spend 4-8 percent of their operating budgets on energy, using only about 3 percent of the national total. A 10-percent rise, then, in the price of imported oil would cause roughly a 0.4-percent increase in production costs, adding about $125 million to farmers' bills, which were up to nearly $81 billion in 1976.

If energy supplies were cut off or sharply reduced—as in the case of

scant natural gas supplies over much of last winter—American farmers and the food industry could be hamstrung trying to maintain the high food and fiber production levels the world has grown accustomed to.

Slow-rising food prices. In the past year or so, U.S. food prices have been rising less than the general cost of living, and our farm product exports (in excess of agricultural imports) have contributed over $10 billion annually to the U.S. trade balance, which has been hurting because of the high oil import bills. These contributions by U.S. agriculture would be jeopardized by energy cutbacks.

Fertilizer production consumes large quantities of natural gas, and adequate amounts of chemical fertilizer are vital for the success of farmers' operations. One estimate is that one-third to one-half of agricultural yield is due to the use of chemical fertilizer.

Many other commonly used chemicals are petroleum based, and transportation and processing also burn fuel as food and fiber wend their way from producer to consumers.

Since an energy shortage at any point in the chain could seriously disrupt the whole system, farmers stand to gain greatly through energy management. Protection from energy shortages is a direct benefit, of course, and so is protection from price rises. By using less energy more efficiently, farmers can usually save money.

Better management. Energy use on the farm can be managed more effectively—without sacrificing either quantity or quality of product—in a number of ways:

- Machinery should be kept tuned and in good working order. A finely tuned engine uses less energy, and usually lasts longer.
- Diesel fuel provides more heat in the form of Btu's per gallon than gasoline does. And diesel engines are more efficient than gasoline-powered ones. Thus, a continuing shift to diesel-powered equipment wherever possible can cut both energy use and cost.
- The use of insecticides, herbicides, and other chemicals can often

Status Report

American supplies of energy should be adequate to get us through this season, according to the experts.

Prices may rise—at a slower pace perhaps than in some past years—but is the energy itself still coming? Supplies of most energy forms are adequate:

- *LP gas.* Propane supplies to traditional LP users are somewhat dependent on natural gas supplies and the Federal Energy Administration's actions regarding drawing off LP supplies to replace curtailed natural gas. However, unless there's a major disruption of supply, there should be enough LP to go around this year.

- *Gasoline.* The brightest star in the energy galaxy, gasoline is expected to be in adequate supply. Stocks right now are above last year's levels and should last through the fall, at least. Shortages in no-lead gasolines could crop up in some regions, however.

- *Middle distillates.* Middle distillates—including diesel fuel and home heating oil—should be adequate for the coming winter. Another extremely cold season could cause problems, though, because stocks are down 15 percent below year-earlier levels, mostly because of last winter's extreme cold.

- *Electricity.* A question mark, electricity could be in short supply in wide areas of the Nation—proving there's a great interdependence of energy sources.

As natural gas supplies continually dwindle, electricity is often called upon to replace the power that gas provided. Particularly strong are the moves to switch to electricity to power irrigation pumps. The added strain on electric utilities may be too much in some areas of the Plains States and elsewhere during peak use periods, and "brownouts" could result.

In the West, the drought could be the source of electric supply problems, because more than half the electric power there is from hydroelectric projects.

- *Natural gas.* The bleakest of the forecasts is for the cleanest burning, cheapest energy source. But while there's little doubt that supplies are diminishing rapidly, there should be enough gas for this season because of the heavy reliance by farmers on intrastate supplies, even though the supplies sold between States are shrinking.

be reduced, without reducing their effectiveness. Farmers can carefully analyze the need for the fertilizers, especially through soil testing, and use them accordingly.

• Insulation of farm buildings requiring climate control can keep out winter's cold and summer's heat, reducing heating and cooling costs.

• Alternative energy sources—those based on something besides the fossil fuels—show considerable potential for future adoption. For example, solar heating systems, such as grain dryers and water heaters, and windmills—or wind turbines—for electric power generation may prove economically feasible.

What is Waste?

If farmers can change their operations to achieve major energy savings, doesn't it indicate past wastefulness?

Not really. In many operations, farmers trying to achieve the potential energy savings would have to make substantial investments in improved technology—investments that may cost more than the energy saved and investments that would have been out of the question when fuel prices were much lower. In addition, even if the move to energy-saving technology is clearly profitable, it might involve the scrapping of present equipment before it is fully depreciated.

Thus it may be difficult, barring some strong economic inducements, to realize quickly and fully the potential energy savings.

[Based on special material from Linley E. Juers, National Economic Analysis Division.]

Government agencies' actions. USDA is working with the Federal Energy Administration (FEA) and other Federal agencies to develop programs to promote energy management and to ensure adequate future supplies for agriculture.

For example, the standby Federal fuel allocation program is being evaluated and updated continuously to meet changing energy needs. The program is to be put into effect by the President in the event of severe fuel shortages.

If the fuel allocation program is activated, there will be three classes of fuel users. Under present plans, class 1 users would be allowed to purchase up to 100 percent of their current fuel needs; class 2 users would be allocated 100 percent of base period needs; and class 3 users would be allowed to buy up to 90 percent of base period needs.

Base assumptions. The base period is a representative year of energy use for the user involved. If a manufacturer is a class 3 user, and in the base year 1972-73 used 100,000 gallons of No. 2 fuel oil, he would be allowed to purchase up to 90,000 gallons under the allocation program.

USDA is urging FEA not to change agriculture's status from class 1 to class 2, as has been proposed by FEA officials. Farm experts argue that no base year is applicable to agriculture because factors such as weather and the varying energy needs of different crops can cause one year's requirements to differ radically from the next year's. For example, it could take more energy to realize a small corn crop that needs much drying at harvest than a large crop that is brought in during a dry and sunny fall.

What is agriculture? Moreover, there's a question of what agriculture really is, and what agricultural production entails. USDA experts are working with FEA to ensure that the definition of agricultural production includes facets of the food and fiber system USDA deems critical to the successful operation of the system as a whole.

To illustrate: Under an early version of the regulations for fuel allocation, the manufacture of sanitary food containers wasn't included under the heading "agricultural production." But without such containers the food system—from farm to consumer—could break down. USDA experts caught the problem and recommended a change.

The program. ERS is working on these and other concerns as part of a growing USDA energy program. One ERS activity is to assess the socioeconomic effects of shale oil and coal development on agricultural areas. The impact of extensive mining and processing operations will be evaluated in the study, now underway and scheduled for completion in 1981 (although parts of it will be completed this year).

Another ERS project is evaluating the impact of solar energy on agriculture. While the Agricultural Research Service (ARS) works to develop solar applications, replacing the use of fossil fuels in many cases, ERS assesses the impact on

the food and fiber sector of that replacement. One initial finding: Solar technology is expensive, at least for now. In future years, the cost for solar applications may go down because of improved technology as well as economies of scale—the more units that are constructed, the lower the cost for each one.

Attracting sun power. Rising fossil fuel prices, according to ERS researchers, also will play a part. They'll serve to make solar energy a more attractive alternative for many applications.

Looking to another renewable resource, ARS also is conducting a 2-3 year experiment using wind turbines to generate electricity to power irrigation pumps. Currently, according to ERS, over half the energy used in pumping irrigation water is natural gas. However, many users are being forced, because of decreasing natural gas supplies, to use other fuels for their pumps, even though they're more expensive. Among the alternatives to natural gas are electricity, diesel fuel, gasoline, and liquid propane (LP), a common alternative to natural gas that also faces a rough future.

The LP limiters. Although they're adequate for present needs, LP supplies are limited by both natural gas and oil supplies. LP is made from two-thirds natural gas and one-third oil, so is dependent on both. Therefore, it's unlikely LP supplies will expand sufficiently to meet significant additional demands.

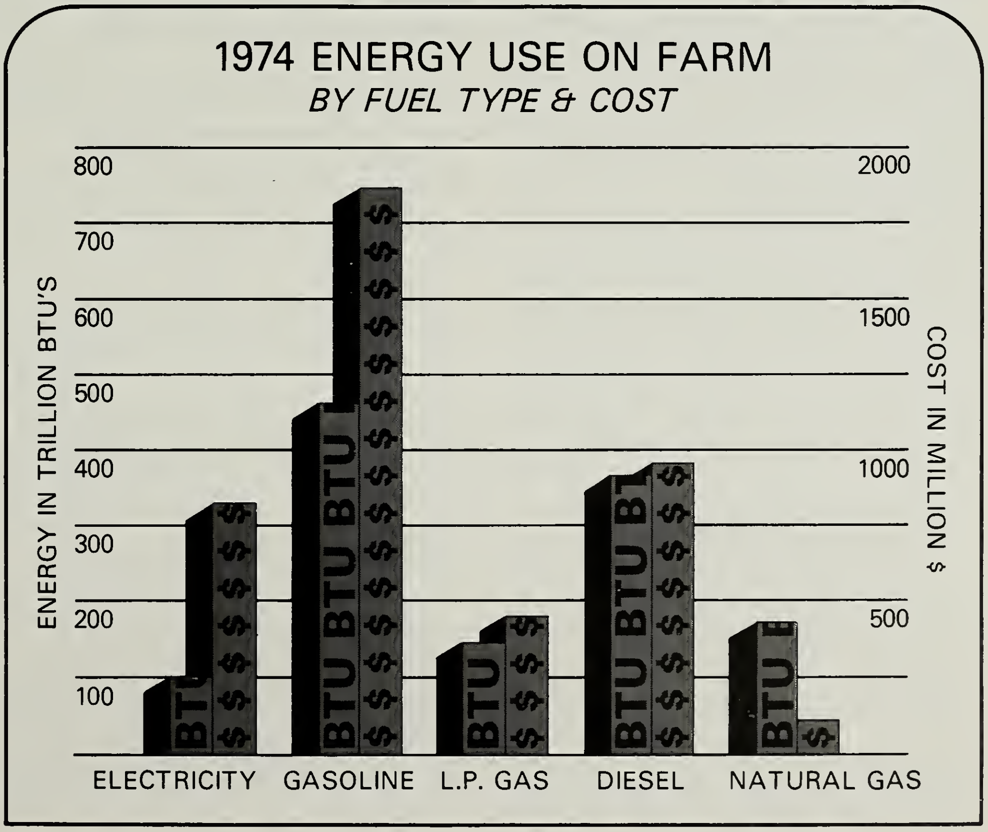
Given the limitations on energy supplies, then, the best thing the individual can do to save energy is to practice sound energy management techniques. USDA will soon distribute six energy guidebooks, developed by ERS, which will suggest ways farmers can save energy economically. The guidebooks are for producers in different facets of agriculture:

- Dairy
- Poultry
- Livestock
- Field crops, which use more energy than any other agricultural process
- Vegetable crops
- Orchard crops

In each of these areas, substantial energy savings—sometimes as high as 25 percent—may be realized through better energy management.

A long-term problem. Energy problems, though, will stay with us. But they can be eased. ERS and USDA will be involved in a series of continuing programs, such as evaluation of energy impacts on farmers of new legislation from Congress; working to smooth rough spots caused by electric power shortages; and disseminating information on the economic and energy effects of new technology on the American farmer.

[Based on special material from R. Thomas Van Arsdall and Edward Rall, National Economic Analysis Division.]



Biomass Agriculture: Growing U.S. Energy

American farmers may soon grow crops to be used directly in the production of energy to meet the Nation's needs—if biomass production proves feasible.

The process of converting plant matter into a commercial fuel source could circumvent the millions of years required for plant energy to become fossil fuel. If feasible, this renewable fuel source could meet up to a tenth of U.S. energy needs.

Implications of biomass production can be staggering. While giving every American a crucial margin of relief from the energy crunch, the prospect of growing energy crops can have a great impact on farming and land use.

The basic technology already exists, yet the major obstacles of growing biomass, and of using the biomass for energy production at a price competitive with fossil fuels must still be solved.

Agricultural implications. To U.S. agriculture, the idea of biomass production raises all kinds of interesting implications. Besides the obvious interest that farmers may have in the prospect of a new cash crop outlet, the vast acreages needed for biomass feedstock may raise land-use policy questions, as well as those concerning agricultural priorities.

With present biomass technology, an estimated 100 million acres of biomass feedstock would need to be cultivated to yield fuel for a tenth of the current U.S. energy needs.

Today, about 110 million acres of additional land are believed to be convertible to agricultural use by 1985. Energy crops may be able to compete for this and other agricultural lands if energy prices continue to rise.

Rising land demand. Since 1972, the demand for land to produce agricultural crops has increased. Farmers have added nearly 40 million acres to food production since set-aside acreage was released in 1973-74, and they're edging toward the cropland acreage levels of the early 1950's. Demand for U.S. food, fiber, and timber production is increasing because:

- Foreign demand is rising, as world population increases. The U.S. already exports production from 30 percent of its acreage.
- Domestic demand is rising although population growth has slowed to near the replacement level.
- Incomes are rising worldwide. This increasing worldwide buying power adds to the food demand.
- Political decisions and weather patterns can greatly affect demand for U.S. food.

More production. With such pressures, the U.S. will have to increase agricultural production in coming years. Biomass land use may hinge somewhat on whether that increase can be achieved through improved yields rather than through greater acreage.

Besides the food production acreage required, biomass feedstock acreage would have to compete with other land users, such as urban, transportation, and industrial developments that demand an additional 900,000 acres of rural land per year. Still another 200,000 acres are taken for artificial reservoirs.

Faced with such competition, the potential biomass crop producer must ponder key economic questions:

- Will biomass production pay?
- Is it competitive with other crops?
- Will a dependable market exist?
- Are large capital investments in machinery and equipment required?

Convincing needed. Farm operators are traditionally cautious about making radical changes in land use. Before they will turn to raising biomass feedstock, they must be convinced of its financial advantage.

Before biomass production proponents can move to establish a commercial-scale outlet for such feedstock, practical economic production of energy must be devised.

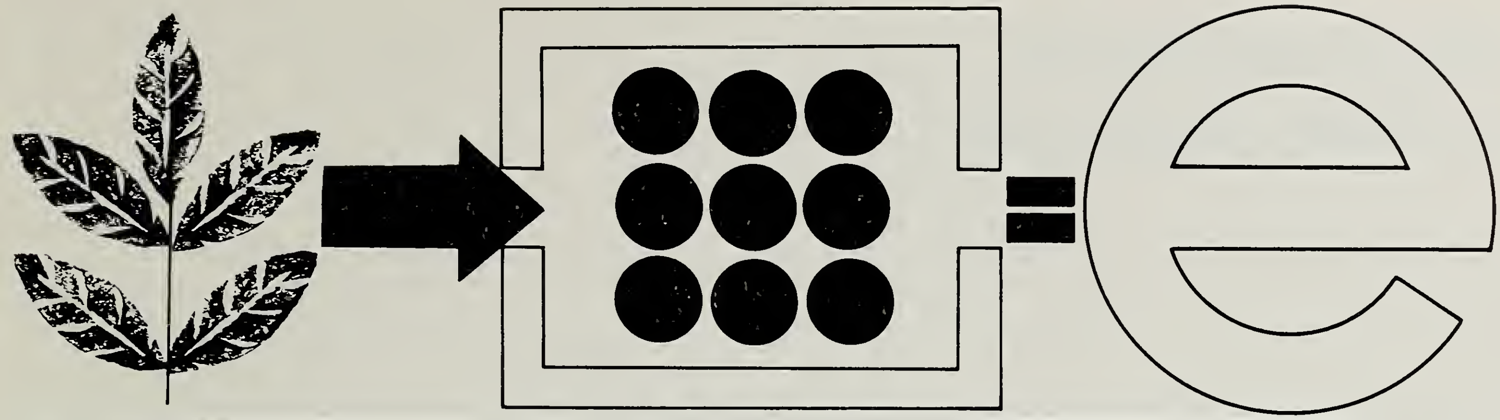
Last January, the average price of energy from crude oil was about $1.50 per million Btu's at the domestic wellhead.

Using corn as a biomass feedstock, raw material costs alone would total about $3.70 per million Btu's. With an Illinois average corn yield of just over 4 dry tons per acre in 1976—about 53 million Btu's per acre—corn for silage grosses about $196 per acre. Biomass processors would have to at least match that price to entice farmers to produce corn for energy.

Sugarcane, another possible biomass crop, would cost around $3.80 per million Btu's.

An exception is biomass from silviculture. Sycamore raw material would cost a little more than $1 per million Btu's.

Extracting problem. Even if the needed raw materials can be obtained



at a reasonably low price, extracting energy from biomass feedstock is less efficient and more expensive than processing crude oil. Also, biomass is generally bulky, perishable, and seasonal, thus complicating the storage and utilization scheduling.

Still another obstacle is that the biomass industry would have to establish its own infrastructure for processing, marketing, and distribution—an undertaking that demands substantial investments.

While all of these obstacles are formidable, biomass remains a potentially feasible alternative energy source that is by no means discounted at this point.

The need to bring production costs in line with those for fossil fuels can conceivably be met by lowering biomass production costs, increasing fossil fuel prices to a point where biomass is competitive, or by government subsidy.

It appears that, in the face of rising land and production input costs, a substantial reduction in biomass production expenses is unlikely. Yet, rising fossil fuel prices appear inevitable.

Land-use planning. If biomass production does proceed, then greater pressures may result for careful land-use planning, more efficient crop production to maximize utilization of the land, development of renewable or self-generating nutrients to apply to crops, efficient farming practices to protect land and water resources, and improved weather prediction and modification to reduce crop losses.

While biomass production technology is too new to allow firm conclusions to be drawn on its economic feasibility, the enticement of a new, renewable energy source for America could, in time, bear financial fruit for farmers.

[Based on the speech, "Biomass Production: What Land is Available?", by Melvin L. Cotner, Natural Resource Economics Division, at the Fuels from Biomass Symposium, University of Illinois, Urbana-Champaign, April 18, 1977.]

An Ancient Answer to a Modern Crisis

Biomass energy conversion may be a newfangled answer to providing crucial energy for the Nation, but the basic idea has been around a fair number of years.

In fact, biomass energy was one of mankind's greatest discoveries.

Although scientists are now developing sophisticated methods for releasing the solar energy that is captured by plant matter on a large, commercial scale, cavemen used the simple method of burning wood to release solar energy for warmth, light, and protection from hungry sabre-toothed tigers.

Biomass energy, like virtually all other energy sources, originates with the sun. Through photosynthesis, sunlight is absorbed by chlorophyll in the leaves and stems of green plants. Chlorophyll reforms water and carbon dioxide into oxygen and carbon compounds.

Captured solar energy is stored as chemical energy in the carbon compounds, and it may be used in a number of ways.

Man first used this energy by eating the plants. Then, he learned to burn them for heat, light, and protection.

As agriculture and industry evolved, man burned plant material to kill insects, to improve grasslands, to hunt, to clear fields, to cure clay, to extract metals, and to fashion tools and weapons.

The discovery of the easy use of fossil fuels led to an era in which these more convenient energy sources were tapped. But fossil fuels take millions of years to form, and the supply will someday be exhausted.

Thus modern scientists are now examining direct means of tapping the sun's energy through solar heating devices, and from constantly and rapidly replenishing sources such as biomass.

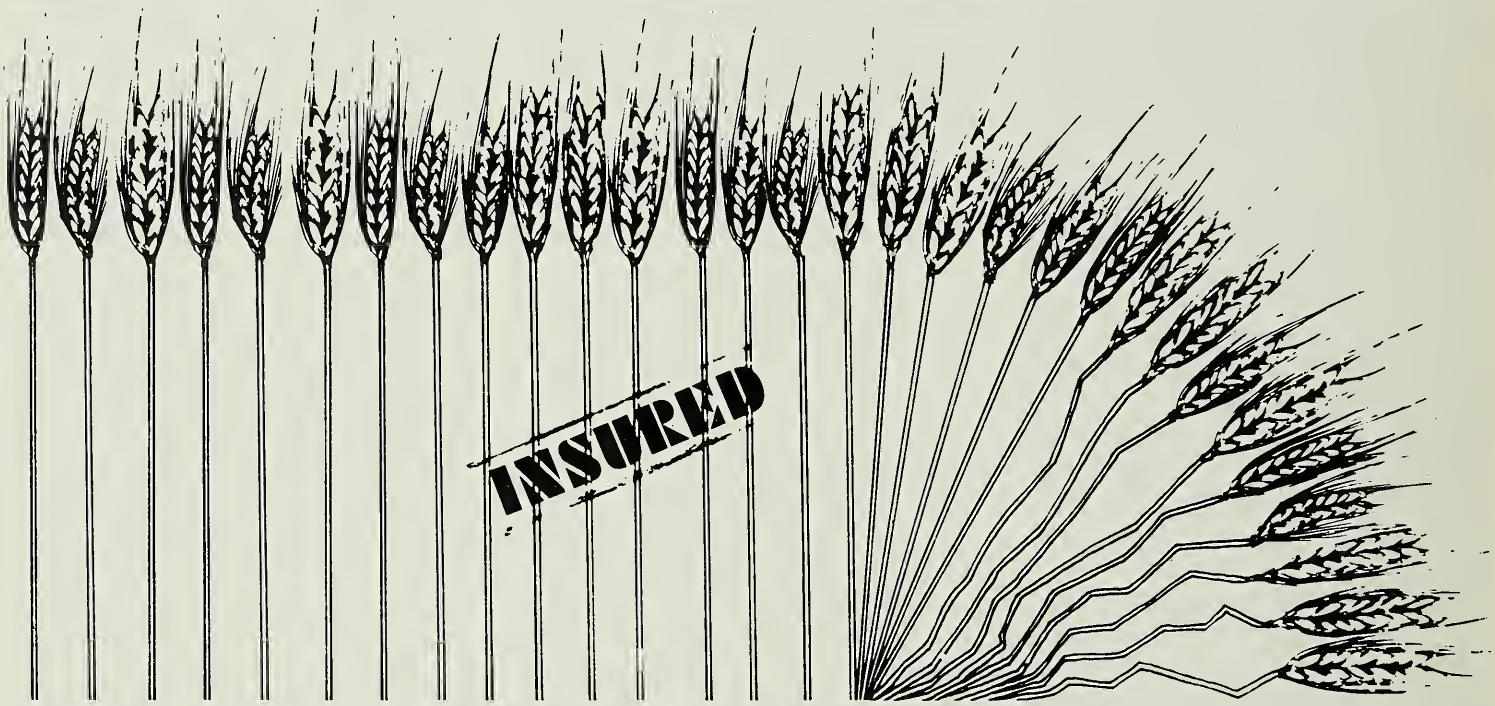
While perhaps borrowing from a concept dating back to early man, today's researchers must add the latest technology to do the job on the necessary large scale that would provide up to a tenth of the current U.S. energy needs.

Biomass plant material may be burned for heat for direct use, or to generate electricity. Yet, instead of burning the plant matter—or animal waste—in its natural form, modern biomass fuel would be chemically converted into fuels such as hydrogen, methane, and ethanol, for practical application.

Despite the modern-day sophistications, biomass conversion entails a note of irony. After ages and ages of progress, mankind may return to that far-distant point in history when the first great scientist used flint or friction in the first artificial biomass conversion—which was called "fire."

[Based on special material by Kathryn Zeimetz, Natural Resource Economics Division.]

Crop Insurance: A Risky Business



Some things are just not insurable, despite what insurance ads would lead us to believe. Take farming, for instance.

Oh yes, there are various insurance programs, both private and Federal, that protect the farmer against certain, specified disasters, but there are many loopholes. In other words, the insurance industry is well aware that farming is still a risky business.

Agricultural risks range from those considered sound enough for insurance—ones for which premiums can be estimated and set at a level that covers expected losses and operating costs—to those that are not. The "ideal" risks—insurance wise—have the following characteristics: (1) are random over time and geographic area, (2) have limited liability, (3) cannot be affected by management choices, and (4) have a clearly identifiable loss.

A quick tally of the major risks in farming shows that most of them—particularly for crops—do not measure up to the insurance "ideal." In fact, only one crop risk comes close—hail.

Hail coverage. Hail losses on one farm are practically independent of those on other farms, and losses in 1 year have no relationship to those of other years; hail is tangible and is not subject to any control or action by the farmer; and it strikes often enough so that farmers are willing to pay a fair premium for insurance coverage. Hence, private insurance companies offer insurance against this natural disaster.

The other vagaries of the weather as well as insect infestations which hit crops are shunned by private insurance, though. The Federal Government, or the farmers, are left to pick up the tab.

Drought is a good example. It tends to affect a large number of farmers in a given year, meaning that from an insurance standpoint, there is the possibility of a catastrophic loss. Although it may be possible for premiums to equal losses over a period of years, the swings in losses make it difficult for the private insurance industry to spread out its operating expenses.

The FCIC. Here's where the Federal Crop Insurance Corporation (FCIC) comes in. It offers farmers a voluntary program whereby for a premium, 45–75 percent of their average crop yield is insured against unavoidable losses.

There are a couple of hitches in the program, however: (1) only 22 crops (albeit major ones) are eligible, and (2) since the FCIC is required to operate on an actuarially sound basis, it refuses to sell insurance if it deems the risks are too great.

For example, since 1955, 14 counties of Colorado, New Mexico, and Texas have been excluded from the program as a result of high losses from a prolonged drought. And the exclusion is not always on a county or area-wide basis—it can be by individual farm or groups of farms. Therefore, the FCIC coverage does not extend to the 20–25 percent of the cropland where the risks of failure are high.

There are administrative problems, too. The law limits direct appropriations for FCIC administrative and operating expenses to $12 million annually, with any premium income to pay operating expenses above that figure. Since its inception in 1938, FCIC has used about $74 million in premium income for expenses. If such a practice continues, the program could be in financial jeopardy, as it dips further into reserves normally kept for unforeseen loss payments.

Little appeal. Also, even where FCIC coverage is available, few farmers take advantage of it. In 1976, for example, only 17 percent of the eligible acreage of wheat, corn, barley, grain sorghum, and cotton was insured under the program. The obvious question then arises: Is an insurance program with such a low level of participation really viable?

There is another Federal program which, in a sense, is in competition with the FCIC—although it covers farmers in high-risk areas who would not otherwise be covered. That is the Disaster Payments Program (DPP), authorized by the Agriculture and Consumer Protection Act of 1973.

Under the program, producers of cotton, wheat, feed grains, and rice are partially protected against income losses if they are prevented from planting a crop or if they obtain low yields because of natural disasters or other conditions beyond their control. Relief is in the form of direct payments to the farmer.

DPP problems. Since the DPP is a form of free "insurance" that is not based on premiums or any actuarial calculations of payments and losses, it is substantially more costly to the taxpayer than the FCIC. Also, the DPP is fraught with problems:

(1) The DPP payment rate of one-third of the target price is much less than the value of the crop and often below the actual cost of production. Also, a farmer receives the same payment whether he is prevented from planting or suffers a loss the day before harvest. And obviously a farmer has a lot more money tied up in a crop ready to cut than unplanted ground.

(2) Coverage is figured on Agricultural Stabilization and Conservation Service (ASCS) acreage allotments rather than current cropping patterns, and those allotments are based primarily on acreages of 15–25 years ago. Therefore, farmers without acreage allotments are ineligible for benefits, and those who overplant their allotments are eligible only in the case of extreme loss which puts production below the allotment base. Thus, many farmers are excluded from the DPP.

(3) A farmer's eligibility is based on two-thirds of the *projected* yield, but once eligible, payments are based on 100 percent of the established yield. Result: If a farmer produces one unit over his disaster yield, he is ineligible; but if he comes out one unit less, he gets a substantial payment. In other words, a small change in production can mean a big change in benefits.

(4) The "prevented planting" coverage leaves itself open for abuse. For example, in arid regions, producers could simply decide to receive DPP payments under this coverage rather than plant a crop under marginal conditions.

(5) Cotton farmers have coverage more favorable than that for farmers growing wheat or feed grains: They can receive a prevented planting payment even when they plant a substitute crop. Just why this exceptional treatment of cotton exists is unclear. But one thing is known—cotton farmers get the biggest chunk of the prevented planting payments. In 1974-75, their share was nearly 70 percent.

Other options. In view of the above problems and the overlap in programs, several alternative forms of crop insurance are being scrutinized by Congress and the current Administration.

[Based on *Options for Improving Government Programs that Cover Crop Losses caused by Natural Hazards*, ERS-654, by Thomas A. Miller and Alan S. Walter, Commodity Economics Division.]

Mountain States' Agricultural Roundup

This is the third in a series of articles on regional agriculture.

Fat cattle grazing lazily in verdant valleys surrounded by high mountain peaks . . . a pastoral description of Alpine Europe? Possibly, although it's equally suggestive of the semiarid Mountain States.

Doesn't sound much like the region's commonly portrayed image of parched land, scarce water, sagebrush, rattlesnakes, and coyotes. Yet, such rural scenes crop up throughout the area, and it's these farming districts that help maintain agriculture as a major industry in the eight Mountain States (Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona, and New Mexico).

Livestock's importance. Livestock production is the heart of the area's agricultural economy, and has been ever since a few smart pioneers realized the potential of the enormous plains rich in natural animal feed. In 1975, cash receipts for livestock products averaged 56 percent of the region's total receipts—ranging from a low of 38 percent in Idaho to a high of 75 percent in New Mexico.

That same year, cattle and calves were the number one cash commodity in six of the eight States—the only exceptions being Montana, where they came in second behind wheat, and Utah, where they trailed only slightly behind first-placed dairy products. Some of the largest cattle feedlots in the country are in Arizona and Colorado.

Most land in pasture and range. More than half of the region's land area was used as grassland pasture and range in 1974, compared with less than a tenth for cropland. If it weren't for the well-suited livestock, much of the Mountain States' 306 million acres of pasture and range would not be used at all, due to sparse rainfall.

Thus, throughout the region, irrigation—mainly from mountain snowpack—is needed to support any intensive crop production. According to the latest Census of Agriculture, 56 percent of the area's farms and 5 percent of the total farmland (including pasture and range) were irrigated in 1974.

Large-scale irrigation. Nationwide, the Mountain States boast over a fourth of the irrigated farms and nearly a third of the irrigated acres.

When combined with the neighboring Pacific States, the two western regions have more irrigation than any other section of the country.

Of course, Mountain States' farmers produce a lot of dryland field crops, too, such as wheat and hay. It wasn't always so popular, however. One early Utah farmer testified in court that wheat could be grown without irrigation and was promptly indicted for perjury. He returned home, named his place "Perjury Farm," and became one of the most successful producers of dryland wheat in the State. The rest is history.

Net income. But it was mainly irrigation, plus the profitable livestock business, that enabled Mountain States' farmers to net $1.7 billion in farm income in 1975—about 7 percent of the $22.7 billion that all farmers earned that year.

And with 5 percent of the Nation's farms and about 25 percent of the land in farms (census figures), the region produced $6.9 billion worth of farm goods in 1975—almost 8 percent of the total national farm output of $90 billion.

Of all the Mountain States, only Colorado ranked among the top 20 farm States in 1975 (based on the value of cash receipts), coming in 17th. The sale of livestock products accounted for nearly two-thirds of the Centennial State's $1.9 billion of farm marketings, with wheat, corn, sugar beets, hay, and potatoes contributing heavily to the balance.

Thriving sugar beets. Irrigation—begun on a large scale when the Union Colony was founded at Greeley in 1870—has played a key role in the State's agricultural success. Today, over half of Colorado's farms are irrigated, and certain commodities, such as sugar beets, have thrived in the rich, sandy soil. In 1975, based on the value of farm marketings, the State was fourth in the Nation for this product.

In addition to sugar beets, Colorado ranked among the top 10 States for cash receipts for five other leading commodities that year: cattle and calves and hay, sixth place; barley, seventh; and sorghum grain and turkeys, tenth.

Other honors. Colorado wasn't the only Mountain State to receive honors in 1975, however. Others that ranked among the leading States for cash receipts for the 25 top commodities were:

- Idaho—potatoes, first; sugar beets, second; hay and barley, fifth; and apples, tenth.
- Montana—wheat and barley, fourth; and sugar beets, tenth.
- Arizona—hay, second; oranges, third; cotton and grapes, fifth; sorghum grain, sixth; forest products, ninth; and barley, tenth.
- New Mexico—sorghum grain, eighth; and peanuts, ninth.
- Wyoming—sugar beets, ninth.

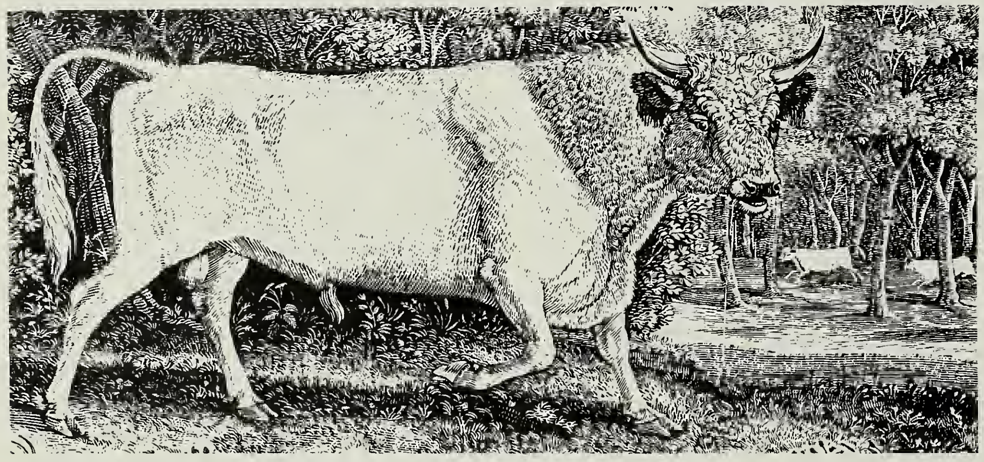
Specialty crops. Besides the production of the big money-making crops, each Mountain State grows a number of specialty items. Ever wonder where those mouth-puckering jalapeño peppers come from? Probably New Mexico.

In 1975, the Sunshine State planted nearly 6,000 acres of chile and jalapeño peppers along the banks of the Rio Grande. In fact, there was more acreage in chile than any other vegetable crop. And although a number of commercial processing companies now can, freeze, or dehydrate the famous product, long *ristras* of red chile drying in the sun can still be seen throughout the State.

Don't forget the horse. And since New Mexico is the Mountain State

(Continued on page 15)

How Cattle Conquered the West



No other chapter of U.S. agricultural history has been romanticized as much as the great western cattle drives. Countless songs, books, movies, and television shows have glamorized the lives of the "lonesome cowboys," who drove the huge herds up north from Texas.

The drives began in Texas, where there was a surplus of cattle and no buyers. In 1865, the Lone Star State's ranges were overstocked with some 6 million head. Up north, it was a different story; supplies were low and prices good. As one writer put it, the drives were begun to "connect the $4-cow with the $40-market."

Before long, Texas cattle were grazing on the abundant grasses of the Great Plains, where they were fattened before shipment to Chicago for slaughter. Other Texas herds were driven straight to the railheads in Kansas for immediate shipment.

Vast cattle ranches appeared throughout the area, and in a number of Mountain States—particularly Colorado, Montana, and Wyoming—the ranches were financed by large eastern and British corporations. These corporate officers seldom, if ever, saw their herds, leaving the ranching operation up to hired managers and cowhands.

Shares were sold in these corporations on the basis that every cow would have a calf every year, and that the calves would be raised without cost on the grass of the public domain.

Although the corporations were looked upon with disdain by the private ranchers, both groups were equally dependent upon free grass. The ranchers ranged their herds over the public domain, too, sometimes holding particular areas by custom or force.

The open range era of the cattle industry only lasted a few decades, with a number of factors contributing to its downfall. First of all, the expansion of the railroads encouraged farmers to take advantage of the Homestead Act allotments—the 1862 Act granted 160 acres of land to farmers, while making no provisions for ranchers, who needed much more than 160 acres to maintain a herd of cattle. The free grass that the cattlemen held was likely at any time to be claimed and plowed by homesteaders.

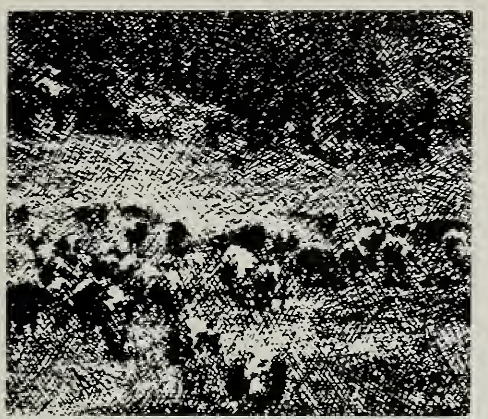
Since the average cattleman had no incentive to conserve the open range, he frequently overstocked, and, consequently, overgrazed the land. This situation, combined with the homesteading threat, left the cattle industry in a vulnerable situation.

Low market prices, the emergence of cattle rustlers, who made inroads on the herds, and the severe winter of 1886–87, which killed up to 75 percent of the cattle in some locations, tipped the scale and brought an end to the open range cattle business.

As a result, eastern and foreign investors stopped their blind speculation in livestock; better business methods were followed by the ranchers; and the quality of the livestock was improved. Above all, the losses of 1886–87 convinced many ranchers that cows and calves could not be run on northern ranges without provision for feed and shelter, and that better use had to be made of the grass.

Out of the era of the open range, the ranch cattle industry developed. Stockmen acquired land either by purchase or lease, fenced their lands, drilled wells and built water storage reservoirs, divided their range into summer and winter grazing areas, cut meadow grass for hay, began irrigating hay land and growing alfalfa, and started to develop better beef cattle by controlled breeding.

[Based on special information from Wayne D. Rasmussen, National Economic Analysis Division.]



(Continued from page 13)

whose agricultural economy is most dependent on livestock products, mention should be made of the horse—the animal which evokes the most vivid picture of the development of the West. After all, without the horse, there might have been no cowboys and no cattle drives.

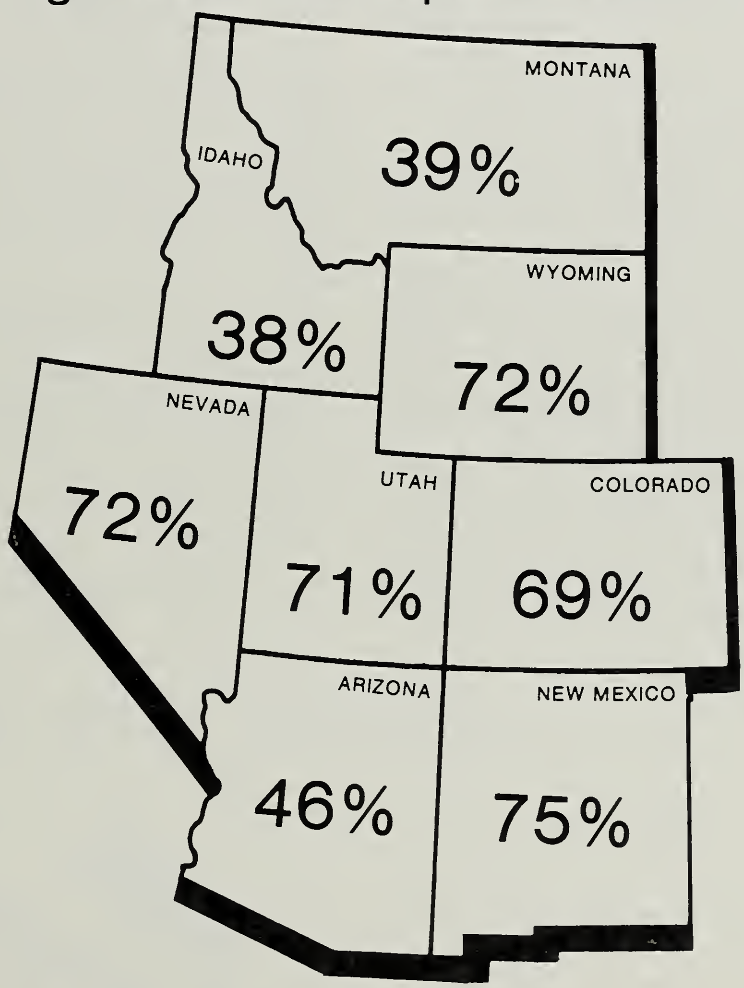
Following a depressed period, the market for New Mexico horses is again on the upturn, with estimates of 110,000 head today. Most of the demand is for pleasure or race horses—jokingly referred to as the "hobby horse" business. The upswing is important not only for the added livestock income, but also as an additional market for feed grains.

Other specialties. Other Mountain States' specialties include Nevada's "Hearts-of-Gold" cantaloupes, Utah's honey, Colorado's sheep-feeding business, and Arizona's booming citrus and fresh vegetable industries.

Thanks to irrigation, the Grand Canyon State is the country's third largest producer of citrus, after Florida and California. As for fresh vegetables, Arizona is a distant second behind California in the combined Pacific-Mountain States region—which accounts for 55 percent of all fresh vegetable output. In 1975, both lettuce and lemons were among the State's top 10 cash crops.

But even in Arizona, where fruit and vegetable crops are big business, cattle are still king—same as in most of the other Mountain States. In 1975, the sale of livestock products accounted for almost half of the State's cash receipts from farm marketings.

Livestock's Share of Agricultural Receipts — 1975



Livestock includes meat animals and products.

King-sized farms. Because of the region's long association with the cattle industry, and because it typically takes so many acres of land to support a cow, farms are large—averaging over 2,000 acres in 1974. This is five times the national average of 417 acres. Acreage per farm is largest in Arizona, Nevada, Wyoming, and New Mexico, reflecting the generally lower yield potential of the land in these States and the higher proportion of cattle ranches.

In line with a nationwide trend, the number of Mountain States'

farms has decreased since 1935, while the average size has increased. According to the latest census, from 1969 to 1974, the number of Mountain States' farms and the amount of land in farms each fell 1 percent, while the average farm size increased slightly—by less than 1 percent.

Agriculture's role. Agriculture—and especially livestock production—will continue to play an important role in the Mountain States' economy, with western farmers striving to compete with other sections of the country. Their ability to compete will continue to be hampered somewhat by the very nature of the land on which they struggle to make a living.

The extremes in temperature, the recurring droughts, the constant winds, the never-ending search for new water sources, and the inability of much of this part of the U.S. to provide a living for more than a very sparse population has caused many Mountain States' farmers to move to less hostile natural environments. Yet, to the many who have chosen to stay, it is still a land of freedom, wide-open spaces, and opportunity.

Future concerns. As for the future, three areas that merit attention are the region's timber, grass, and coal resources.

Although much of the Nation's timber is found in the Mountain States, much more could be produced through tree farming—if there were sufficient economic incentive. Many deserted farms, now grown up with useless types of shrubs and trees, could be replanted to useful timber.

Away from the tree-covered mountainous areas, grass should be encouraged and improved. Controlled grazing of both public and private lands—adjusted when rainfall is more or less than usual—is an important way of maintaining grass cover and checking erosion.

The development of coal in the Fort Union region of Wyoming and Montana (this area, which also includes part of North Dakota, contains about half of the Nation's mineable coal resources) could disrupt the normal way of life of those living there.

The area is composed mainly of sparsely settled agricultural communities that don't adequately support community services. The envisioned growth resulting from coal mining developments could generate growing pains that would more than offset the benefits of increased population.

Farmers in this region may feel an economic impact from increased off-farm employment and higher wages.

[Based on special material from Thomas Frey, Washington, D.C., Aaron Nelson and Eric B. Oswald, Tucson, Ariz., and Clyde Steward, Logan, Utah, all with Natural Resource Economics Division; Donald Durost and Wayne D. Rasmussen, National Economic Analysis Division; Charles Porter, Washington, D.C., and Thomas Miller, Colorado State University, Commodity Economics Division; Lloyd Bender, Montana State University, Economic Development Division; and Norm Newcomer, New Mexico State University, Herbert D. Pownall, University of Wyoming, and E.A. Powell, University of Nevada, all with the Cooperative Extension Service.]

Windmills—Friends of Farmers

The Old West . . . cowboys, Indians, cattle rustlers, range wars, and windmills. Windmills? That's right. Windmills were found to be a fairly inexpensive way of bringing the vital irrigation and stock water to the surface of the arid land. Many are still used.

Actually, the railroads are generally credited with first bringing windmills into use in the West. The railroad companies explored for untapped underground water reserves to provide water for the locomotives as they traveled across the dry stretches and for the towns they hoped would develop along the rights-of-way.

The windmill was a popular means of mechanically bringing the water to the surface. It was only a matter of time until farmers and ranchers made use of the precious water discovered and put the windmill to use.

The early pioneers who followed the push of the railroads settled in the newly opened lands with high hopes, but they found that the 160 acres allotted by the Homestead Act were illogical for this land—too much to irrigate and too little for dryland farming.

Sometimes it was the one or two acres irrigated by a windmill that allowed the homesteader to hang on when others were forced to leave. The windmill enabled the settler to plant a vegetable garden for the family food supply; permitted the fencing of pastures—as long as the wind blew, the sheep and cattle had a continuous supply of water; and allowed ranchers to bring water to the grass.

[Based on *Agriculture Made New Mexico Possible*, by the Cooperative Extension Service of New Mexico State University.]

The Hazards of Farming

The 1970's may be turning into the decade of farm safety, following the trend in the 1960's of rising farm accident rates.

ERS analysts report that the farm death rate peaked at 17.7 persons per 100,000 in 1967, but dropped to 16.1 in 1975. That's just above the year earlier 15.1 rate, the lowest recorded during the 10-year period.

While at least 60 percent of all farm fatalities are work related, many are not. The breakdown reflects the combination work and recreation activities that are unique to farm life. Much of the recreation involves swimming and fishing, and drownings are a major cause of accidental farm deaths.

Safety at play. Drownings— from both work and nonwork activities— accounted for 14 percent of the 1,625 farm deaths in 1974. These drownings—mostly in the summer—point to the need for safe practices outside work, as well as on the job.

Machinery-related accidents—machinery is the number one contributor to farm fatalities—accounted for 24 percent of farm fatalities in 1974. And 77 percent of these accidents were in the prime work months, April-October. Being crushed or struck by an object was the cause of death in 18 percent of farm fatalities Many of these accidents were also machine related.

The chief victims of machinery accidents were older people (those over 55), showing that age can become a factor when assessing causes of farm accidents.

While these older persons represent only a fourth of the workforce, they're involved in a third of the fatal accidents. Nearly half the people killed by machinery in 1974 were over 55.

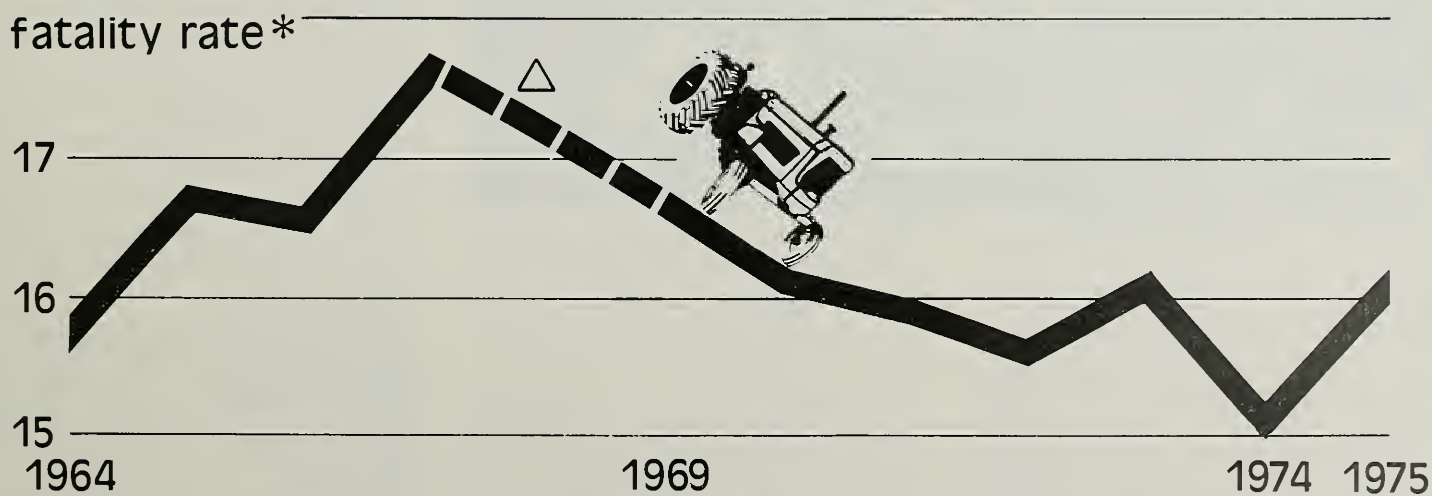
Youths are victims. Younger people, on the other hand, are the most frequent victims of drownings and suffocations.

Seasonal factors are also present in onfarm fatalities, and indicate areas where more attention is needed at certain times of the year. Machinery deaths generally happen in the work months; drownings are a summer tragedy; and shooting deaths most often occur in the October-January hunting season.

Other fatalities on the farm include, in order of frequence: falls, natural factors, electric shock, suffocation, burns, and poisons.

[Based on special material from John M. Zimmer and Conrad F. Fritsch, Economic Development Division.]

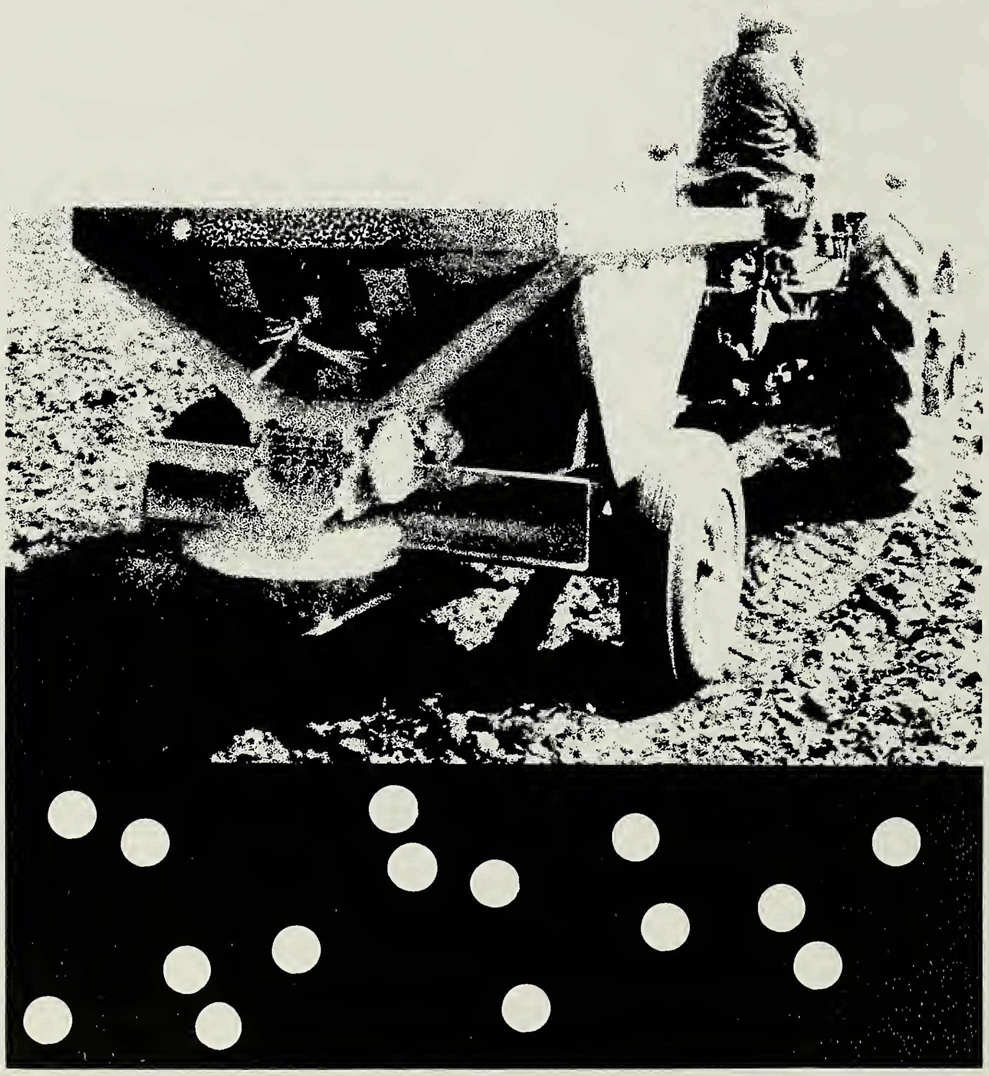
Farm Accident Fatality Rates, 1964-1974



* Rate per 100,000 Persons.
△ 1968 Data not Available.

Source: U.S. Dept. of Commerce, Farm Population Series, P-27; and U.S. Dept. of Health, Education and Welfare, National Center for Health Statistics.

The Fertilizer Spread



Thanks to an increasing demand for America's agricultural products, both at home and abroad, chemical fertilizer output and use have surged since 1950. Last year, American farmers applied more than 5 times as much primary nutrient fertilizer as they did a quarter century earlier. Nitrogen use alone jumped tenfold.

Primary fertilizer nutrients are nitrogen, phosphate, and potash, and together they account for nearly half of the 50 million tons of total fertilizer material consumption in the U.S., excluding manure.

Far-flung fertilizer. As late as 1950, there were few fertilizer manufacturers. Today, however, there are more than 60 firms, with nearly 200 plants producing nitrogen fertilizers, plus plants turning out phosphate and potash products. Operations—particularly for nitrogen fertilizers, which make up half of America's primary nutrient consumption—have moved to where the input supplies are. For nitrogen, that means nearer to the dwindling supplies of natural gas. Hence, the Delta and Southern Plains States, with their natural gas, water, and railroad transportation, host most U.S. ammonia manufacturing plants.

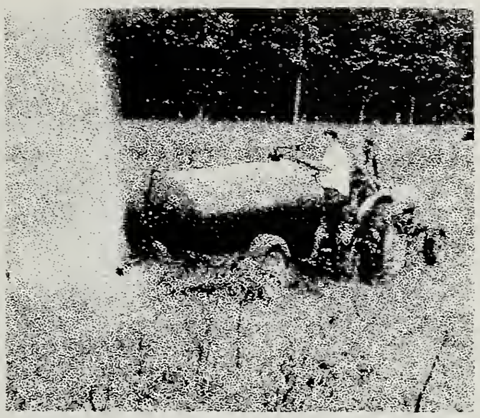
Completing the triangle. About a quarter of the primary nutrient fertilizer is potash, more than 80 percent of that coming from Canadian mines. The mines there have thicker seams of the potash ore, with a richer content, making the northern product cheaper and easier to mine. U.S. potash production, located mostly in the western States, peaked in 1966. Currently, the U.S. is a net importer of potash.

But America is a net exporter of phosphate, the third major chemical in the triangle of primary nutrients. Obtained from phosphate rock, most phosphate is mined and processed in the Southeast, and there are no supply problems on the horizon.

Besides concentration of fertilizer plants in a few geographical areas, the structure of the industry has changed.

A secondary product. For many operations, fertilizer is no longer the primary product. Many companies produce fertilizer only as an important sideline.

And cooperatives have been taking an increasing share of the fer-



tilizer business in recent years. Since 1960, when cooperatives produced 6 percent of the Nation's fertilizer, their share of the market has climbed to more than 21 percent, and it's still growing.

At the same time, chemical companies' share of the industry has dropped from 34 to 17 percent, while petroleum companies' share has climbed, from 20 percent in 1960 to 22 percent last year. However, petroleum producers' influence has fluctuated widely, from a low of 13 percent in 1964 to a high of 32 percent in 1975.

Part petroleum. The participation by the oil companies in the fertilizer industry hinges on the supply of natural gas. Some petroleum producers are also major suppliers of natural gas; and as natural gas supplies grow tight, its use in fertilizer manufacturing often has to take a back seat to home heating or other priority uses.

Natural gas serves two functions in manufacturing ammonia fertilizer. It provides the necessary clean heat and power for operating the plant at a relatively low price, and, hydrogen from the natural gas itself is mixed with nitrogen in the air to make anhydrous ammonia.

In the face of expected natural gas shortages, the search is on for new and different base materials—feedstocks—for fertilizer manufacture. Producers are eyeing a number of alternatives:

- *Synthetic Natural Gas (SNG).* More and more, for many purposes, SNG is seen as an alternative to natural gas. But right now, it's expensive and facilities for manufacturing it are still in their infancy.
- *Other gases.* Currently, 2-3 percent of the ammonia producers use gases other than natural gas. These gases, such as chlorine cell hydrogen and coke oven gas from steel producers, can be used to make ammonia, but not in quantities great enough to allow their complete adoption now. The gases are generally a byproduct from another manufacturing process, with ammonia production only a sideline.
- *Naphtha, fuel oil, or coal.* Some producers are considering modifying their plants to use these fuels, but currently each is more expensive than natural gas.

Shortage unlikely. Even given the critical natural gas situation, a fertilizer shortage isn't expected for the near future.

Although the severe winter of 1976/77 did prompt natural gas curtailments to producers in some States, only a small cutback in production resulted. Loss in early 1977 was an amount equivalent to 750,000 tons of ammonia, out of an estimated 11-million-ton total supply. The cutback has been more than offset by last year's carryovers, increased production capacity, and imports of nitrogen. The total chemical fertilizer supply for this year tops last year's by about 5 percent.

Problems and questions. The nitrogen supply situation is only one of several question marks facing the fertilizer industry. Others include:

- *Canadian potash supplies.* The best potash mines in Canada are in Saskatchewan, and the government there has indicated it plans to acquire a 50-percent interest by buying out private owners.

While this action should not materially affect supplies, it may create some problems for U.S. firms that have invested in the Saskatchewan mines.

- *Price.* For the remainder of this year, prices to the farmer may be fairly stable, with normal season fluctuations. On the other hand, they could dip late this season, depending on whether supply outstrips demand. Dealers could find themselves offering discounts if demand fizzles and stocks remain large.
- *Future supplies.* Besides the shortage of natural gas for fertilizer production, manufacturers have to deal with the cost of building new plants. For example, today it costs $55-75 million to build a new ammonia plant, triple what it was only 10 years ago.

Cost concerns. Contributing to the cost increases are inflation, ballooning costs of materials, rising engineering fees, and increasing labor costs. And, the problem has worsened because of the 3-5 year lead time for new plant construction.

If the costs of new plants continue to escalate it could pose a greater problem to producers, and ultimately to farmers—who will be the ones who'll have to foot the bill through higher fertilizer prices.

[Based on the manuscript, "The United States Fertilizer Industry: Its Changing Structural and Economic Characteristics," by Duane A. Paul, Richard L. Kilmer, Marilyn Altobello, and David N. Harrington, National Economic Analysis Division.]

Commodity Profile

Cotton Blossoms

Soft, fuzzy, and in demand. That's cotton, a natural fiber with an expanding crowd of admirers.

The demand for the natural look and feel of cotton is causing growers to up their intended 1977 plantings sharply over last year, to 13.7 million acres—a 17-percent increase.

Last year's cotton plantings, responding to higher farm prices, climbed to 11.7 million acres, up from 1975's low 10 million. Production also rose from 8.3 million bales in 1975 to 10.6 million last year.

The greater production has been sought because of boosted demand—largely the result of higher personal disposable income worldwide, which in turn causes higher cotton prices. Favorable prices are encouraging farmers from California to Texas and beyond to shift many acres from grain sorghum to cotton.

Shifting to soy. A few cotton growers in the Southeastern States, on the other hand, are making a different shift, away from cotton and toward soybeans. Explanation: Profit. While bean prices jumped 60 percent over year-earlier levels in January-March 1977, most cotton prices were up a fourth, and grain prices were slipping 5-15 percent.

Such shifting isn't new to cotton, though. About 30 years ago, the public started shifting away from cotton and other natural fibers to manmade. Polyester became a household word, and cotton wilted, relegated to a secondary role.

The reason for the switch to manmade fibers is easy to figure: They're cheaper than natural. In April of this year, for example, cotton delivered to U.S. mills sold for 81 cents a pound—nearly $400 a bale—compared with 58 cents for rayon and polyester.

But over the last decade, personal incomes have trended up, and even though cotton is more expensive, many individuals are opting for its more fashionable look.

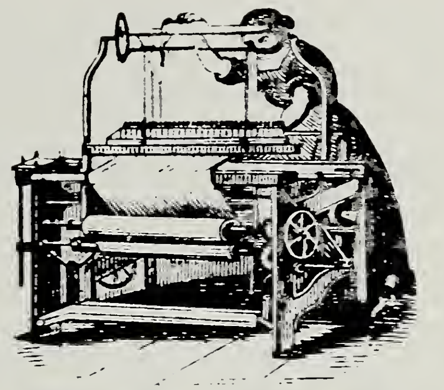
The synthetic blend. Demand also increased when manufacturers discovered that cotton blends in so well with polyester that the result is a better fabric than polyester alone.

Further, the foreign demand for U.S. cotton is crucial. The U.S. is the number 1 exporter of cotton in most years, followed by the U.S.S.R. American cotton is accounting for 28 percent of world exports in 1976/77, up from over 17 percent in 1975/76, but slightly below 1973's 31 percent —a very big year.

Exporting about 20-25 percent of the U.S. crop is considered normal. But the high yields and sizable plantings of 1973 caused an abun-

COMMODITY PROFILE: COTTON

Production:	Nearly 11 million bales in 1976, with 11 million acres planted and a yield of 451 pounds per acre.
Value of production:	More than $2 billion yearly to the 150,000-200,000 producers in the Cotton Belt for the sale of cotton lint, plus sales of cottonseed and other cotton products.
Leading States:	Texas, California, Mississippi.
Exports:	About 5 million bales projected for this year, up slightly over last year.
Trends:	Strong worldwide demand and tight supplies may continue through this season.



dant supply. That, plus devaluation of the U.S. dollar that year, made 1973 a record export year for U.S. cotton producers.

The biggest customer—by far—for U.S. cotton is Japan, followed by South Korea.

Digging into carryovers. U.S. export prospects for 1976/77 have strengthened in recent months, even though foreign production of 46.9 million bales is estimated at nearly a million above year-earlier output. But foreign consumption is outstripping production by about 7 million bales this year, causing exporters to dig deeply into their carryovers. With foreign competitors' cotton supplies down, more buyers are turning toward the U.S.

The result: American cotton exports are up nearly 2 million bales over year-earlier levels, and prices are improved over last year. At that time, the European price, for example, was about 70 cents a pound or $336 a bale. Now, that price is over 80 cents.

Steering away from shyness. One effect of the boosted cotton prices has been less shying away from cotton production by American farmers. They'd been steering clear of cotton in recent years, partly because of reduced demand for it, and partly because other crops—namely soybeans and peanuts—proved more profitable.

Growing cotton is expensive, with heavy reliance on inputs such as fertilizer and pesticides. Prices for these inputs have been heading sharply upward because of energy shortages.

Since cotton is a net user of nitrogen, fertilizer use runs high. And the boll weevil and other bugs can be fought off only with large quantities of pesticides. All in all, it cost an average of $233 an acre to produce cotton in the U.S. in 1976, and this year's costs are expected to climb by 5 percent. Costs per pound could run from 44 to 51 cents, depending on yield.

Expenses expected. But that's a national average. Regionally, costs may drop a little in the Southeast, which averaged 68 cents a pound last year, and in the Delta, where the average cost was 58 cents. In the largest producing areas—the Southwest and Far West, where costs were 45 cents and 33 cents, respectively—expenses may climb.

Still, the yields are all-important, and nearly unpredictable. Over the past decade, cotton yields have seesawed from a low of 434 pounds per acre in 1969 to a high of 520 pounds in 1973.

As the yields and acreage bounce, so bounces production. Last year, farmers turned out 11.6 million bales on a yield of 465 pounds. For the 1973 crop, 13 million bales were produced, with a yield of 520 pounds. Only 8.3 million bales were harvested in 1975 from a small acreage, with a yield of 453 pounds.

Dusty determinations. One of the problems is cotton dust in mills. Scientists have linked the breathing of cotton dust to lung diseases among workers, and now the Occupational Safety and Health Administration is seeking to set Federal standards limiting the amount of dust permitted in a workspace. Producers and millers alike are watching the rulemaking closely.

This problem is one of those not shared by cotton's competition—manufacturers of manmade fibers. Nor do these manufacturers have to worry about weather, disease, or insects—continuing problem areas for cotton producers.

Also, a manufacturer of synthetics typically has much more money to spend on advertising and promotion than farmers do. For instance, the manmade fiber industry spent about $300 million last year on promotion—15-20 times the money for all cotton research and promotion.

Energy and fibers. A problem common to both manmade fiber producers and cotton farmers is the energy situation. Most manmade fibers are oil-based, using petroleum as a basic building block. Therefore, any curtailments in oil supplies could mean manmades would be in trouble. But so would the farmers, albeit in a different way.

Nearly half the U.S. cotton shipped from warehouses to domestic mills and ports goes by truck, with rail transportation providing for the remainder. If energy supplies restrict the amount of fuel for the truckers, many warehouses, and many farmers, could find themselves paying more for transportation, and experiencing delays in moving their crops.

Chemicals for growth. Cuts in oil supplies could also restrict supplies of much-needed farm chemicals, such as pesticides, fungicides, and fertil-

cides. Fertilizers, too, are energy-intensive, although they use natural gas in their manufacture.

Should supplies of these energy sources be chopped, cotton farmers could have problems in future years.

For this year, though, input supplies are adequate. And, all things considered, the cotton farmers' future should be bright.

[Based on *Cotton and Wool Situation, April 1977*, by Russell G. Barlowe, J. Albert Evans, John V. Lawler, Mildred V. Jones, and Shirley M. Frye, Commodity Economics Division.]

Addresses of State experiment stations:

A ready reference list for readers wishing to order publications and source material published through State experiment stations.

STATE	CITY	ZIP CODE
ALABAMA	Auburn	36830
ALASKA	University of Alaska	99701
ARIZONA	Tucson	85721
ARKANSAS	Fayetteville	72701
CALIFORNIA	Berkeley	94720
	Davis	95616
	Parlier	93648
	Riverside	92502
COLORADO	Fort Collins	80523
CONNECTICUT	New Haven	06504
	Storrs	06268
DELAWARE	Newark	19711
FLORIDA	Gainesville	32611
GEORGIA	Athens	30602
	Experiment	30212
	Tifton	31794
GUAM	Agana	96910
HAWAII	Honolulu	96822
IDAHO	Moscow	83843
ILLINOIS	Urbana	61801
INDIANA	West Lafayette	47907
IOWA	Ames	50011
KANSAS	Manhattan	66506
KENTUCKY	Lexington	40506
LOUISIANA	Baton Rouge	70803
MAINE	Orono	04473
MARYLAND	College Park	20742
MASSACHUSETTS	Amherst	01003
MICHIGAN	East Lansing	48824
MINNESOTA	St. Paul	55108
MISSISSIPPI	Mississippi State	39762
MISSOURI	Columbia	65201
MONTANA	Bozeman	59715
NEBRASKA	Lincoln	68583
NEVADA	Reno	89557
NEW HAMPSHIRE	Durham	03824
NEW JERSEY	New Brunswick	08903
NEW MEXICO	Las Cruces	88003
NEW YORK	Ithaca	14853
	Geneva	14456
NORTH CAROLINA	Raleigh	27607
NORTH DAKOTA	Fargo	58102
OHIO	Columbus	43210
	Wooster	44691
OKLAHOMA	Stillwater	74074
OREGON	Corvallis	97331
PENNSYLVANIA	University Park	16802
PUERTO RICO	Rio Piedras	00928
RHODE ISLAND	Kingston	02881
SOUTH CAROLINA	Clemson	29631
SOUTH DAKOTA	Brookings	57006
TENNESSEE	Knoxville	37901
TEXAS	College Station	77843
UTAH	Logan	84322
VERMONT	Burlington	05401
VIRGINIA	Blacksburg	24061
VIRGIN ISLANDS	St. Croix	00850
WASHINGTON	Pullman	99163
WEST VIRGINIA	Morgantown	26506
WISCONSIN	Madison	53706
WYOMING	Laramie	82071

Economic Trends

[1] Ratio of index of prices received by farmers to index of prices paid, interest, taxes, and farm wage rates. [2] Average annual quantities of farm food products purchased by urban wage earner and clerical worker households (including those of single workers living alone) in 1959-61—estimated monthly. [3] Annual and quarterly data are on 50-State basis. [4] Annual rates seasonally adjusted first quarter. [5] Seasonally adjusted. [6] As of March 1, 1967. [7] As of March 1, 1975. [8] As of February 1, 1976. [9] Beginning January 1972 data not strictly comparable with prior data because of adjustment to 1970 Census data.

Source: U.S. Dept. of Agriculture (Agricultural Prices, Foreign Agricultural Trade, and Farm Real Estate Market Developments); U.S. Dept. of Commerce (Current Industrial Reports, Business News Reports, Monthly Retail Trade Report and Survey of Current Business); and U.S. Dept. of Labor (The Labor Force and Wholesale and Consumer Price Index).

Item	Unit or Base Period	1967	1976 Year	1976 April	1977 Feb.	1977 Mar.	1977 April
Prices:							
Prices received by farmers	1967=100	—	186	189	187	190	193
Crops	1967=100	—	198	193	203	211	217
Livestock and products	1967=100	—	177	186	174	171	172
Prices paid, interest, taxes and wage rates	1967=100	—	192	191	200	201	204
Prices paid (living and production)	1967=100	—	188	187	194	196	199
Production items	1967=100	—	193	193	199	201	204
Ratio [1]	1967=100	—	97	99	94	95	95
Wholesale prices, all commodities	1967=100	—	182.9	181.3	190.0	191.9	194.3
Industrial commodities	1967=100	—	182.3	180.1	189.9	191.6	193.2
Farm products	1967=100	—	191.1	192.9	199.0	202.4	208.1
Processed foods and feeds	1967=100	—	178.0	178.0	181.9	183.9	188.5
Consumer price index, all items	1967=100	—	170.5	168.2	177.1	178.2	179.6
Food	1967=100	—	180.8	179.2	187.7	188.6	190.9
Farm Food Market Basket: [2]							
Retail cost	1967=100	—	175.4	174.9	178.6	178.3	179.1
Farm value	1967=100	—	178.8	184.0	181.1	178.0	179.4
Farm-retail spread	1967=100	—	173.2	169.2	177.0	178.5	178.9
Farmers' share of retail cost	Percent	—	40	41	39	39	39
Farm Income: [3]							
Volume of farm marketings	1967=100	—	121	99	99	97	92
Cash receipts from farm marketings	Million dollars	42,817	94,793	6,611	6,569	6,538	6,200
Crops	Million dollars	18,434	47,802	2,430	2,919	2,674	2,300
Livestock and products	Million dollars	24,383	46,991	4,181	3,650	3,869	3,900
Realized gross income [4]	Billion dollars	49.9	104.2	—	—	105.6	—
Farm production expenses [4]	Billion dollars	38.2	80.9	—	—	83.1	—
Realized net income [4]	Billion dollars	11.7	23.3	—	—	22.5	—
Agricultural Trade:							
Agricultural exports	Million dollars	6,380	22,996	1,932	2,046	2,293	2,209
Agricultural imports	Million dollars	4,452	10,992	896	1,127	1,300	1,404
Land Values:							
Average value per acre	Dollars	168[6]	390[8]	—	456	—	—
Total value of farm real estate	Billion dollars	182[6]	396[8]	—	460	—	—
Gross National Product: [4]	Billion dollars	796.3	1,691.6	—	—	1,796.1	—
Consumption	Billion dollars	490.4	1,079.7	—	—	1,159.1	—
Investment	Billion dollars	120.8	239.6	—	—	267.9	—
Government expenditures	Billion dollars	180.2	365.6	—	—	378.5	—
Net exports	Billion dollars	4.9	6.6	—	—	−9.3	—
Income and Spending: [5]							
Personal income, annual rate	Billion dollars	626.6	1,375.3	1,352.5	1,464.2	1,486.5	1,497.6
Total retail sales, monthly rate	Million dollars	26,151	54,324	53,696	58,175	59,400	59,397
Retail sales of food group, monthly rate	Million dollars	5,759	11,749	11,448	12,200	12,479	12,512
Employment and Wages: [5]							
Total civilian employment	Millions	74.4	87.5	87.3	89.0	89.5	90.0
Agricultural	Millions	3.8	3.3	3.4	3.1	3.1	3.3
Rate of unemployment	Percent	3.8	7.7	7.5	7.5	7.3	7.0
Workweek in manufacturing	Hours	40.6	40.0	39.4	40.3	40.4	40.2
Hourly earnings in manufacturing, unadjusted	Dollars	2.83	5.19	5.07	5.43	5.49	5.52
Industrial Production: [5]	1967=100	—	129.8	128.4	133.2	135.0	136.1
Manufacturers' Shipments and Inventories: [5]							
Total shipments, monthly rate	Million dollars	46,487	98,184	98,178	106,092	111,372	—
Total inventories, book value end of month	Million dollars	84,527	166,587	158,134	168,449	169,164	—
Total new orders, monthly rate	Million dollars	47,062	98,513	99,816	106,534	112,121	—

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